RESEARCH

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in Liquid Reservoirs

I, LOUIS COATALEN, a Citizen of the French Republic, of 7, Rue Lesueur, Paris (Seine), France, do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to liquid reservoirs for liquids having a pressure head under which the liquid must be able to flow freely from the reservoir, as is the case, for example, with the liquid reservoir of a hydraulic braking installation in which a pump sucks the oil from the bottom of the said reservoir.

Such a reservoir is usually made of metal, for example sheet iron, and the base thereof is directly and rigidly connected by a pipe, which is also rigid, to the intake of the pump. With such a reservoir, it is not possible to observe the level of the liquid therein. Moreover, all the vibrations set up by the pump are transmitted to the base of the reservoir, which frequently becomes resonant and which, in any case, is a seat of vibration. Such vibrations frequently cause a more or less rapid deterioration of the fluid-tight joint between the said base and the pipe, so that leakages occur.

The invention concerns a reservoir for liquids having a pressure head, by means of which these disadvantages are avoided.

According to the invention, in the reservoir of transparent or translucent material, a rigid liquid discharge pipe is connected to the reservoir by a resilient connecting member fitting tightly in a hole in a wall of the said reservoir, the adjacent end of the discharge pipe being spaced from the wall of the reservoir.

The material of which the reservoir is made, may be glass or a synthetic material such as methyl polymethacrylate which is not elastic, and consequently the reservoir, and in particular the base thereof, does not vibrate.

In the accompanying drawings, which are given merely by way of example:—

Figure 1 is an elevation, partly in section, of a liquid reservoir according to the invention;

Figure 2 is a cross-sectional view thereof, on the line 2—2 of Figure 1;

Figure 3 is a longitudinal sectional view of the resilient connecting member in the free condition, and

Figure 4 is a longitudinal section, on a larger scale, through a sleeve intended to hold the connecting member in position in the discharge hole formed in the base of the reservoir.

Referring to the drawings, the reservoir R, which consists of a transparent or translucent material, for example, glass or a synthetic material such as methyl polymethacrylate, and which may be of any desired form, is in this instance of circular section with a downward taper, having a side wall 1, a flat base 2 and a neck 3. The said neck is screwthreaded at 4 to receive a closure device formed by the superposition of three walls 5, 6, 7 having holes 8, 9, 10 formed therein in staggered positions and constituting air inlets.

The wall 1 has formed thereon two parallel ribs 11 extending circumferentially, which are intended to retain between them a securing collar 12 provided with a boss 13 engaged in a cavity 14 in the said wall 1, the collar serving to support the reservoir by having its ends secured to a suitable surface such as the engine bulkhead of a vehicle, and the boss 13 preventing rotation of the reservoir in the collar 12.

The rigid base 2 has a hole 15 formed therein. Engaged in this hole is a connecting member 16 of rubber or similar resilient material. Externally, this connecting member comprises (Figure 3) an upper flange 17 intended to bear against the inner face 18 of the base 2, a cylindrical portion 19 substantially equal in diameter to the hole 15 in the bottom 2

of the container, while being of greater length than the said hole, a frusto-conical portion 20, a cylindrical portion 21 and an end strengthening bead 22. Internally, the connecting member comprises an enlarged portion 23, followed by a cylindrical portion 24 of smaller diameter. The said portion 24 is situated opposite to the outer cylindrical surface 19, but is longer than the said surface, and is jointed by a frusto-conical portion 25 to a cylindrical outlet passage 26.

The connecting member is passed through the hole 15 from the inner side, so that its cylindrical portion 19 lies in the said hole, the flange 17 resting on the inner face 18 of the base 2. There is then forced into the said connecting member a rigid sleeve 28 (Figures 1 and 4), preferably of metal, the outer cylindrical surface of which is larger in diameter than the inner cylindrical surface 24 of the connecting member 16, while being of substantially equal length thereto. In addition, the said outer surface 29 has projecting therefrom a lower bead 30 on which a frusto-conical surface 27 is formed, an intermediate bead 31 having a frusto-conical surface 32 facing in the same direction as the surface 27, and an upper flange 33.

It will be understood that when the sleeve 28 is forced into the connecting member 16, which is made possible by the frusto-conical surfaces 27 and 32, which expand the connecting member elastically, the latter is strongly compressed between the cylindrical wall of the hole 15 in the base 2 of the tank R and the outer surface of the sleeve 28, the flange 33 of which finally becomes lodged in the portion 23 of large diameter of the connecting member while the bead 31 strongly compresses the elastic material of the connecting member within the length of the hole 15, and the bead 30 causes this material to form a bulge at 34 (Figure 1) below the base 2 of the tank. This base is therefore gripped between the flange 17 and the said bulge 34, whereby the connecting member 16 is longitudinally fixed to the base 2, while a complete seal is formed between this base and the connecting member by reason of the radial compression of the connecting member in the hole 15 under the action of the sleeve 28 and, in particular, of its bead 31.

Finally, the rigid tube 35 for the discharge of the liquid is engaged in the hole 26 of the connecting member its end being spaced a certain distance from the base 2 and from the sleeve 28, it being possible to lock the connecting member, if desired, on the said tube by means of a locking collar surrounding the cylindrical surface 21 of the said member.

It will be understood that the resilient connecting member 16 prevents transmission of vibrations from the tube 34 to the base of the reservoir, which is not exposed to the danger of breakage. The reservoir does not vibrate at all and in addition enables the level of the liquid inside it to be observed at any instant.

Naturally, the invention is not limited to the embodiment illustrated and described, which has only been chosen by way of example, the form of the reservoir, the means by which it is secured, and the manner in which it is closed, as well as other details, being capable of variation without departing from the scope of the invention as defined in the appended claims.

The invention is particularly suitable for use in connection with liquid pressure braking installations on automobile vehicles, but is also applicable to liquid reservoirs for other purposes.

What I claim is:—

1. A liquid reservoir of transparent or translucent material for liquids having a pressure head under which the liquid must be able to flow freely from the reservoir, wherein a rigid liquid discharge pipe is connected to the reservoir by a resilient connecting member fitting tightly in a hole in a wall of the said reservoir, the adjacent end of the discharge pipe being spaced from the wall of the reservoir.

2. A liquid reservoir according to claim 1, wherein the resilient connecting member is expanded into tight contact with the edge of the hole in the reservoir by a sleeve forced into the said connecting member.

3. A liquid reservoir according to claim 2, wherein the connecting member is formed with a flange which engages the inner wall of the reservoir around the hole in the said wall and the bore of the said member is enlarged at the flanged end to receive an external flange on the sleeve, the connecting member having, below the flange thereon, an external cylindrical surface of greater length than the thickness of the reservoir wall at the hole and of a diameter substantially equal, in the free state of the connecting member, to the diameter of the hole, the connecting member also having a cylindrical bore of greater length than the external cylindrical surface thereon extending from the enlarged part of the bore, and the sleeve, which has a length substantially equal to, and a diameter greater than the free

diameter of, the said cylindrical bore, having also two circumferential projecting beads, one near the centre of its length and the other at the end of the sleeve remote from the flange thereon, the first of said beads lying within the hole in the reservoir when the parts are assembled, and the second lying beyond the outer end of the said hole and producing a bulge in the wall of the connecting member beyond the outer end of said hole.

4. A liquid reservoir for a liquid having a pressure head under which the liquid must be able to flow freely from the reservoir, substantially as described with reference to, and as shown in, the accompanying drawings.

For the Applicant:
F. J. CLEVELAND & COMPANY,
Chartered Patent Agents,
29, Southampton Buildings,
Chancery Lane, London, W.C.2.

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1 SHEET

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.

Fig. 1.

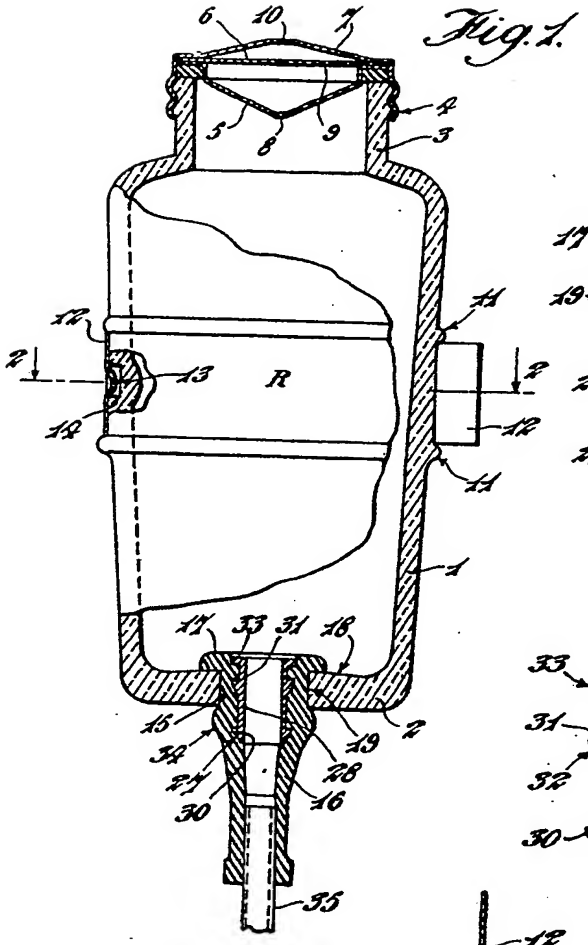


Fig. 3.

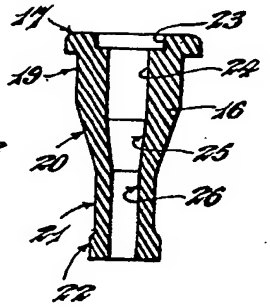
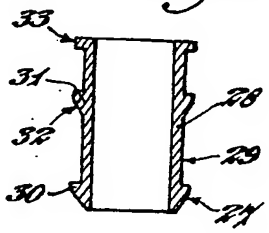


Fig. 4.



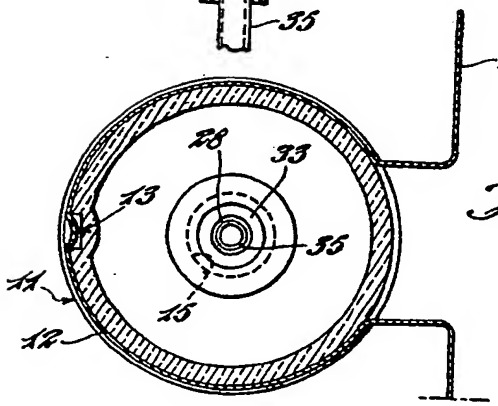


Fig. 2.

Charles & Read Ltd.